

## GAS DANGER DETECTOR SIMULATION IN TINKERCAD

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The project is designed to determine the level of gas contamination. The project specification is presented in the following list:

- Arduino Uno R3 (1 piece) – U1
- Voltage Multimeter multimeter (1 piece) – Meter1
- 4700 ohm Resistor (1 piece) – R1
- Piezo (1 piece) – PIEZO2
- LED RGB (1 piece) – D1
- 220 ohm Resistor (4 pieces) – R2, R4, R6, R3
- Gas Sensor (1 piece) – GAS1
- 250 kOhm, Potentiometer (1 piece) – Rpot1
- LCD 16 x 2 (1 piece) – U2

The scheme is presented by URL [1,2]:

<https://www.tinkercad.com/things/ePMLkBT1cZE-analoggassensor>

The level is measured by the Analog Gas Sensor in conventional units and is converted to the scale [1,100], using the map function.

```
valorSensor = map(valorSensor, 755, 306, 100, 1);
```

The Voltage Multimeter indicates the sensor output voltage and is not controlled by the microprocessor.

The level of gas contamination is conditionally divided into three zones:

- GREEN ZONE – no problem.
- YELLOW ZONE – there is some trouble.
- RED ZONE – danger!!!

If the gas contamination is in the green zone (from 0 to 50), then the LED lights up green, and no sound is output.

If the gas contamination is in the yellow zone (from 50 to 75), then the LED lights up yellow, and sound is output

If the gas contamination is in the red zone (from 75 to 100), then the LED lights up red, the frequency of the sound signal increases

When creating the Arduino microprocessor program code, the technology of writing small scripts «on the fly» was widely used [3].

### References

[1] Бочаров Б. П., Новожилова М. В., Чуб И. А. Gas concentration in several rooms monitoring // Information technologies in education: electronic supplement to the journal «Educational Institutions Libraries». – №. 10. – С. 14-32.

[2] Бочаров Б. П., Воеводина М. Ю. Gas analyzer circuit emulation in tinkercad // Information technologies in education: electronic supplement to the journal «Educational Institutions Libraries». – №. 10. – С. 1-8.

[3] Бочаров Б.П. Інформаційні технології в освіті: монографія / Б.П. Бочаров, М.Ю. Воеводіна; Харків. нац. ун-т міськ. госп-ва ім. О. М. Бекетова. – Харків: ХНУМГ ім. О. М. Бекетова, 2015. – 197 с.